

## MEGACHILIDAE

*Anthidium* sp. (2 specimens).

Total:	2	genera	<i>Proctotrypoidea</i> .
	3	"	<i>Chalcidoidea</i> .
	1	"	<i>Vespoidea</i> .
	2	"	<i>Sphecoidea</i> .
	6	"	<i>Apoidea</i> .

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14 genera, 16 species, 28 specimens.

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 ANNUAL ADDRESS.

**Contributions to the Knowledge of the Dactylopiinae of Hawaii.**

BY EDW. M. EHRHORN.

It seems to be the custom at the annual meeting of the Society for the President to read an annual address. In the past I note that these addresses generally contained some account of the insect fauna of these Islands, or dealt with the monographing of some special order, family or genus.

It is my pleasure today to be able to present to you as my address a contribution to the knowledge of the subfamily *Dactylopiinae*, suborder *Homoptera*, family *Coccidae*.

In dealing with this subject I must first call attention to the great difficulty which is met with in the determination of many species of this subfamily. Especially is this true of the genus *Pseudococcus*, the so-called mealy bugs. Many descriptions are quite inadequate to use for determination, and the literature is widely scattered. Much stress has been placed on the measurements of the segments of antennae and other appendages, and although usable at times, yet from general experience such measurements cannot be greatly relied upon. Many species have been described from dried specimens, others from specimens in alcohol. The color, secretion and size of such are only approximate at best. As all these insects,

including the whole family *Coccidae*, are microscopic subjects, it means that carefully mounted specimens are necessary so that all the minute details, so necessary for study, are brought out distinctly. It means that clean work and lots of patience are necessary to accomplish good results.

During my study of these insects I have endeavored to make my observations on the living insect as much as possible, and, fortunately, of the various species found in these Islands, I have been able to get plenty of material. As the insects of this subfamily are not all stationary, I have found that collecting them in pill boxes is best. In the laboratory they are transferred into glass vials for closer study. Many of the *Dactylopiinae* secrete a mealy substance over their body which is very often rubbed off or disturbed by ants. In the study of my specimens I have endeavored to allow the various species, by resting, to construct the secretion, filaments and other appendages as much as possible. My method is as follows: I use round-bottom glass tubes of about  $\frac{5}{8}$  inch diameter and 4 inches long, in which I place a tight-fitting piece of white cardboard, allowing about  $\frac{1}{2}$  inch for cotton stopper. The cardboard does not reach the end of the tube, so that the insects placed in the vial have free access to both sides of the card, and can attach themselves to one or the other side of it. Adult females placed in these tubes have reconstructed the secretion in a few days. They have formed their eggsac; have produced eggs, or given birth to living young, as the case may be. Species well attended by ants with almost no secretion when taken, have developed this to such an extent that it gave the insect a very different appearance than when first collected. How easy it would have been to describe the insect as first found, and then perchance run across a lot unattended by ants and not recognize the species as the same.

The color of the various species can be thoroughly studied while in these vials. The variation in habit of producing the offspring, by being either oviparous, ovoviviparous or viviparous, can also be recorded, and this has been successfully done by the vial method. The structure of the eggsac, whether only used as a bed or whether used as a complete cover for the insect and eggs, is another matter worth recording.

In addition to these interesting observations on the living insects, it is very important to note their habitat on the plants,

whether they are found on the leaves, stems, in cracks of the bark or on the roots.

I have also been successful in breeding immature specimens to the adult stage, both males and females, and it is interesting to note the variation in color of the male and female larvae of *Pseudococcus*.

#### SUBFAMILY DACTYLOPIINÆ.

The *Dactylopiinæ* are a subfamily of the *Coccidæ* or scale insects of the suborder *Homoptera*, and, unlike the majority of coccids, are, with few exceptions, naked, soft-bodied insects. Their bodies are usually covered with some white powdery or cottony secretion, some living exposed on the plant, others enclosed in felted or glassy sacs. The sexes in the larval state resemble each other, but when full grown the male larva usually becomes more elongate, and at times changes color, and when full grown spins a cottony cocoon. The male is usually winged, although some apterous forms are known.

The adult female retains the larval form in most cases, especially among the true mealy bugs, increases in size, and produces more secretion, and other striking processes. Like the *Aphidæ* they produce eggs or young. Owing to our semi-tropical climate, we find many of our species have continuous broods. Some species are very prolific and as many as four hundred eggs or young have been recorded. The adult male usually reaches maturity when the female is about one-third grown. In these Islands we have species which live above ground, while other species live below ground and yet other species are found above and below ground.

The first systematic account of the *Coccidæ* of the Hawaiian Islands is recorded in the Fauna Hawaiiensis, Vol. III, Part 2, 1902, by the late G. W. Kirkaldy. In this account are enumerated 9 species of the *Dactylopiinæ*. In Vol. II, Part 3, on page 127 of the Proceedings of the Hawaiian Entomological Society, Mr. J. Kotinsky enumerates 7 more species. I note that in Kotinsky's list *P. aurilanatus* is mentioned as having been introduced on an *Araucaria* and is believed to have been eradicated by destroying the plant. This species has not been recorded since, so that, eliminating that species, there were 15 species of *Dactylopiinæ* known. In Vol. II, Part 4, page 149 of the Proceedings of our So-

ciety I added one species, *Phyllococcus* (*Cissococcus*?) *oahuensis*, making a total of 16 *Dactylopiinae* recorded up to that time.

In the present paper I am adding five genera, of which two are new to science, and nine species, making a total of 25 species of *Dactylopiinae* for these Islands.

#### SYNOPSIS OF GENERA.

- A. Adult female stationary, enclosed in a glassy or horny, fringed ovisac. *Asterolecanium* Targ.
- B. Adult female stationary, living within the ovisac or surrounded by waxy secretion, almost if not covering body. Antennae and legs either well developed or rudimentary.
1. Adult female enclosed in a felted sac. Caudal lobes well developed, body with dorsal and marginal spines. Antennae and legs well developed. Anal ring with eight hairs. *Eriococcus* Targ.
  2. Adult female enclosed in a felted sac. Antennae rudimentary. Apodous. Anal orifice tubular with six hairs, secreting a long cotton tube. Caudal lobes not well developed. *Antonina* Sign.
  3. Adult female resting in a mass of waxy secretion, sometimes enveloping the body, which is quite horny and dark reddish brown. Antennae rudimentary. Apodous. Last antennal segment of larva very large. *Chaetococcus* Mask.
- C. Adult female living in cone-shaped galls on leaves. Body elongate oval, tapering, ending in a chitinous segment with well-developed caudal lobes, forming a funnel, in the center of which is situated the anal ring with six hairs. Antennae with seven asymmetrically formed joints. Legs short and stout, resembling crabs' claws. Anal region strongly chitinous. *Phyllococcus* n. g.
- D. Adult female active, covered with mealy secretion, with or without ovisac. Anal ring with six hairs. Male pupa enclosed in a cottony sac.
1. Antennae normally eight-jointed, sometimes seven-jointed. Margin of body with filaments. Caudal lobes not strongly developed. *Pseudococcus* Westw.

2. Antennae eight-jointed, margin of body beset with projecting tubercles, bearing a number of stout short spines. *Tylococcus* Newst.

3. Antennae eight-jointed. Body usually longer than three times its width. Mentum short. Tarsus half as long as tibia. *Trionymus* Berg.

4. Antennae six-jointed. Caudal lobes well developed, each bearing a chitinous tooth or hook. Adult female enclosed in a brittle powdery white sac. *Geococcus* Green.

5. Antennae six-jointed. Adult female secreting much white meal or cotton. Caudal lobes not conspicuous. *Ripersia* Sign.

E. Adult female active. Dorsum thickly covered with fine hair, appearing glassy. Caudal lobes as in *Pseudococcus* with slender setae. Antennae seven-jointed (many individuals show only six joints). Derm with rows of large round pores on each segment, forming groups at margin. Anal ring with six hairs. *Nesococcus* n. g.

#### SYNOPSIS OF SPECIES.

##### Genus *Asterolecanium* Targ.

Ovisac of female broadly oval. Margin with well-developed fringe. *bambusae* Boisd.

Ovisac of female much narrower, decidedly elongate, carinated in the middle, attenuated at caudal end of body. Infesting bamboo. *miliaris* Boisd.

Ovisac of female circular, usually depressed in the bark of plants, marginal fringe well developed. Infesting oleander, fig and many other plants. *pustulans* Ckll.

##### Genus *Eriococcus* Targ.

Adult female yellowish brown, enclosed in a closely felted white sac. Antennae and legs well developed. Anal ring with eight hairs. Infesting *Araucaria* species. *araucariae* Mask.

Genus *Antonina* Sign.

Adult female living at the base of leaves of bamboo, enclosed in a white felted sac. Body purplish black. *crawii* Ckll.

Adult female living at the base of leaves of grasses. Body dark blackish brown or purple. *indica* Green.

Genus *Chaetococcus* Mask.

Adult female imbedded in a white waxy secretion. Body dark brown, about 5 mm. long by 4 mm. broad. Living under the sheaths of bamboo. *bambusae* Mask.

Genus *Phyllococcus* Ehrhorn.

Adult female viviparous, of a dirty lemon color, slightly covered with white secretion. Living in cone-shaped galls. Antennae with seven asymmetrically formed joints. Legs short and stout, resembling crabs' claws. Anal region strongly chitinous. Anal ring with six hairs. Infesting leaves of *Urera sandwicensis* (Opuhe). (*Cissococcus?*) *oahuensis* Ehrh.

Genus *Pseudococcus* Westw.

Adult female oviparous, dull brownish yellow, marginal appendages short, of about equal length, those of caudal lobes longer. Egg sac more or less spherical. Eggs amber yellow. *citri* Risso.

Adult female ovoviviparous, resembling *P. citri*, but more convex and not as elongate. Marginal appendages not as stout. Color reddish brown. Infesting pineapple, sugarcane, banana, canna roots, nut-grass, and on roots of other plants. *bromeliae* Boisid.

Adult female viviparous, color yellow, thickly covered with white powdery secretion. Caudal appendages long and slender, marginal tufts filiform. Infesting ferns, caladiums, orchids, etc. *longispinus* Targ.

Adult female viviparous, light brown. Caudal appendages stouter than in *longispinus*. Dorsum with two dark markings running lengthwise with body. Infesting hibiscus, cotton, poinsettia, beans, etc. *virgatus* Ckll.

Adult female oviparous, dark purple, producing a globular cottony eggsac, almost covering insect. Infesting hibiscus, cotton, citrus, etc. *filamentosus* Ckll.

Adult female oviparous, elongate, narrow cephalad, of a light purplish color, covered with white secretion, giving body a grayish appearance. Four stout caudal appendages, those of margin wanting. Eggsac very elongate, when not disturbed resembling *Pulvinaria*. Infesting bulbs.

*lounsburyi* Brain.

Adult female oviparous, narrow, elongate oval, color gray, slightly covered with white powdery secretion. Cottony eggsac, not covering body. Infesting sugarcane.

*saccharifolii* Green.

Adult female viviparous, large elongate oval, convex, of a delicate pink color, producing a waxy cottony mass under body. Infesting sugarcane.

*sacchari* Ckll.

Adult female viviparous, orange red, covered with a thick waxy secretion forming tufts on dorsum, like a small *Orthezia*. Infesting guava, persea, canna, palms, etc.

*nipae* Mask.

Adult female viviparous, light yellow green. Margin of body with very long, slender, glassy filaments. Antennae and legs long and slender. Infesting *Straussia*. *straussiae* n. sp.

Adult female viviparous, pinkish brown, slightly covered with white secretion. Resembles *longispinus* in form, but marginal tufts wanting, only three last segments with short appendages. Caudal lobes with long setae. Found between folded leaves of *Acacia koa*.

*swezeyi* n. sp.

Adult female viviparous, yellowish brown, male larva grayish green, caudal appendages as long or longer than body. Living in galls on *Santalum*.

*gallicola* n. sp.

Adult female viviparous, light yellowish brown, slightly covered with secretion. Caudal appendages longer than body. Derm with many round pores and scattered hairs. Insects produce quantities of a white, fluffy, mealy substance between the foliage. Infesting *Freyinetia* and *Astelia*.

*montanus* n. sp.



Genus *Tylococcus* Newst.

Adult female viviparous, pink or pinkish brown, thickly covered with white powdery secretion, not hiding segmentation. Margin of body beset with long, coarse, white filaments, 17 on each side. Derm after treatment shows marginal tubercles each with a number of conical spines. Anal ring with six hairs. Antennae as in *Pseudococcus*. Infesting *Pandanus odoratissimus*. *giffardi* n. sp.

Genus *Trionymus* Berg.

Adult female oviparous, of a dark pink color, slightly covered with white powdery secretion, not hiding color nor segmentation. Antennae 8-jointed, short and stout. Eggsac longer and broader than body of female. Infesting grasses. *insularis* n. sp.

Genus *Geococcus* Green.

Adult female oviparous, pale honey yellow, broadly fusiform, surrounded by whorls of fine, glassy hair. Forms a brittle, powdery white sac. Attacking the roots of trees and plants. *radicum* Green.

Genus *Ripersia* Sign.

Adult female viviparous, pale reddish brown, thickly covered with white mealy secretion hiding segmentation. Antennae six-jointed. Margin of body with thick, white, waxy tufts, which often coalesce. Infesting a variety of palms. *palmarum* n. sp.

Genus *Nesococcus* n. g.

Adult female active. Dorsum thickly covered with fine hair, appearing glassy. Antennae seven-jointed (many individuals show only six joints). Legs short and stout, especially femur. Derm when cleared shows rows of large round pores on each segment of the body, these forming groups at margin. Caudal lobes as in *Pseudococcus* with slender setae. Anal ring with six hairs.



Adult female viviparous, light yellow green. Dorsum thickly covered with fine glassy hair. Antennae seven-jointed, but six-jointed individuals are found. Legs short and stout. Derm shows rows of large round pores which form groups near margin. Infesting leaves of *Pipturus albidus*.

*pipturi* n. sp.

*Pseudococcus straussiae* sp. n.

Adult female viviparous, light yellow green, acutely rounded cephalad, egg-shaped. Body very slightly covered with white secretion, not hiding segmentation. Margin with very slender, hairlike filaments about as long as the average width of the body. Four caudal setae present, the two inner pair 6 mm. long, the two outer pair not quite as long as body, glassy white. Insect very active, about 3 mm. long by 2 mm. broad. When placed in KOH body turns yellow with an orange tinge on the cephalic and caudal end of body. Antennae eight-jointed, very long and slender, almost aphid-like, and bearing very long, slender hairs. Joint 8 longest, but at times subequal with 3; joint 5 next; joints 2, 4 and 7 next and subequal; sometimes joint 7 is longer than 4. Joint 1 is shortest and about half as long as 6. Formula: 8, 3, 5 (2, 4, 7), 6, 1, or 8, 3, 5, 7 (2, 4), 6, 1. Legs long and slender, tarsus not quite half the length of tibia. Digitules of tarsus are long, fine hairs; those of claw are club-shaped hairs with flattened end. Caudal tubercles quite prominent, with very long setae about twice as long as the hairs of the anal orifice, also bearing two stout spines and several fine hairs all in a group of prominent round pores. Anal orifice small, with six long, fine hairs. Marginal segments with two stout, short spines in a group of round pores, which area is light brown and quite conspicuous.

Male of the usual *Pseudococcus* type, light yellowish brown. Thorax, head and end of abdomen dark reddish brown. Antennae ten-jointed; joint 3 longest, joints 1 and 2 stouter than the rest, and joint 2 almost egg-shaped. Caudal setae about one-quarter length of body.

Hab.—The species is viviparous and is found on *Straussia hawaiiensis*, at 1800 feet elevation on the Island of Oahu; and on *Myrsine* species at 2900 feet on the Island of Molokai. (Kuhns.)

*Pseudococcus swezeyi* sp. n.

Adult female viviparous; resembles *P. longispinus* in general appearance, but marginal filaments are not developed, only the last three segments bearing short filaments and the caudal lobes with long setae.

Adult female pinkish brown, about 2 mm. long by 1 mm. broad, quite flat, very active when disturbed. Body slightly covered with a thin, white, mealy secretion which does not hide the color nor the segmentation. Legs and antennae light yellowish brown. When placed in liquid potash body turns dark reddish brown and becomes clear after boiling. Antennae eight-jointed, with the 8th longest and 4 the shortest. Joints 1 and 2 are broader than 3, 4, 5, 6 and 7. Joint 8 swollen in the middle so as to be as broad as joints 1 and 2. Each joint with a few hairs, joint 8 with numerous hairs, some of which are quite stout. Joints 5 and 6 subequal. Formula: 8, 1, 2, 3, 7 (5, 6), 4. Legs quite stout. Femur quite swollen. Trochanter plus femur subequal with tibia plus tarsus. Tarsus one-half as long as tibia. Claw stout and sharply curved with dilated digitules. Digitules of tarsus long fine knobbed hairs. Trochanter has a very long stout hair, longer than the hind leg. Anal lobes not prominent, with long fine setae, thinner than the hairs of anal ring, which are stout and about subequal in length with the caudal setae. The lobes also have two very stout, long, conical spines and several long fine hairs surrounded by many round pores forming distinct light brown patches. There is also a similar patch on the penultimate segment near margin; the rest of the marginal patches bear two conical spines and a few round pores, but becomes less distinct as they approach the cephalic end. On the dorsum are numerous long fine hairs and round pores. Caudad of the anal ring is a double row of long fine hairs.

Male cocoon is of the usual type and firm of texture.

Male larva when ready to pupate is light grayish green.

Adult male of the usual type, of a dirty yellow green color. Thorax quite elevated above and of dark brown color; eyes red. Wings iridescent, showing a beautiful pink color in certain light. Caudal filaments snow-white, extending beyond the folded wings about half the length of the body; they are as long as the length of the body. Antennae and legs brown and

quite hairy. Antennae ten-jointed, of the usual type; joints 1 and 2 stouter than the rest, joints 3 and 4 subequal and longer than 5, 6, 7, 8 and 9, which are subequal; joint 2 is subequal with 9, and joint 1 is the shortest.

Habitat.—Between folded leaves of *Acacia koa*, Mount Tantalus, Oahu, Hawaiian Islands. Collected by Mr. O. H. Swezey, for whom I take pleasure in naming the species.

*Pseudococcus gallicola* sp. n.

Adult female viviparous, about  $2\frac{1}{2}$  mm. long, with caudal setae  $3\frac{1}{2}$  mm. long, by  $1\frac{1}{4}$  mm. broad, convex, varying from a grayish green to a yellowish brown color, with a faint dark line running lengthwise in the center of the dorsum. There are three pairs of filaments, which are quite pronounced, the two caudal ones being about twice as long as the two preceding pairs. The filaments on the four other segments are very short. When placed in hot KOH body turns dark reddish brown. Antennae eight-jointed, joint 8 longest. Joint 1 twice as broad as 2, both broader than the rest. Joints 1, 2 and 3 subequal, joint 1 being broader than long at its base. Joints 4, 5 and 6 subequal and a little shorter than 7. Joint 8 is one-third longer than joint 2. All joints bear a few hairs. Legs short and stout. Femur much swollen (middle leg). Femur plus trochanter about sub-equal with tibia plus tarsus. Claw stout, with short flattened digitules; those of tarsus are long fine knobbed hairs. Tibia more than twice as long as tarsus. Caudal lobes well developed, with setae about as long as hairs on anal ring, and also bearing two very stout conical spines in a group of round pores in which are also several long fine hairs. Anal ring large, with usual six hairs, which are stouter than the caudal setae. There is a marginal patch, similar to the one on the caudal lobe, on the penultimate segment. Marginal patches become less pronounced cephalad. There are numerous hairs and round pores scattered on the last segment, as well as on the cephalic portion of the body.

The galls, or rather pockets, in which the insect lives are usually on the upper side of the leaves. The young larvae station themselves on the underside of the very young, tender leaves, and by irritation cause a depression in the leaf, which grows very quickly, forming a deep, pocket-like gall. As the

insect grows its caudal filaments protrude from the opening of the gall. Some galls are found on the underside of the leaves, but not very often.

Habitat.—In galls on leaves of *Santalum littorale*, sea-shore, and *S. ellipticum*, Palolo Valley, Oahu, Hawaii (O. H. Swezey).

*Pseudococcus montanus* sp. n.

Adult female viviparous, about 2 mm. long by 1 mm. broad, measuring with caudal filament 3 mm. long; of a light brownish yellow color. Body covered with a very thin secretion, which does not hide the color nor the segmentation. Antennae and legs light brown. Insects form in clusters between the leaves and produce quantities of white, fluffy, mealy substance, which contains the young. When placed in hot KOH body turns orange brown. Antennae eight-jointed, short and stout. Joint 8 longest, joints 1, 2 and 3 much stouter than the rest. Joints 1, 2 and 3 subequal. Joint 1 is about as broad as long. Joints 4 and 5 subequal. Joint 6 shortest. Joint 7 cup-shaped, a trifle longer than 6, but broader. Joint 8 fits into the cup of joint 7 like into a socket. All joints are quite hairy. Legs much longer than the antennae and very stout, especially the femur, which is very broad. All joints are hairy. Femur plus trochanter is subequal with tibia plus tarsus plus claw (middle leg). Digitules of tarsus, fine hairs with knob; those of claw, curved dilated hairs, reaching beyond claw. Trochanter with very long stout bristle about half as long as femur. All hairs on legs quite long and stout. Anal ring large, with very long stout hairs, much longer than the caudal setae, which are quite slender. Caudal lobes well developed, with two very stout conical spines, which are surrounded by several long stout hairs and small round pores. Each segment bears on its margin a pair of spines with a group of round pores forming distinct marginal patches, which diminish in size cephalad. Derm with very small round pores and scattered hairs.

Habitat.—On *Freyinetia arnotti*, Palolo Valley (O. H. Swezey), and on *Astelia veratroides* on Mount Olympus trail (P. H. Timberlake).

*Tylococcus giffardi* sp. n.

Adult female viviparous, thickly covered with white powdery secretion, not hiding segmentation. Body about 3 to 3½ mm. long by 1½ to 2 mm. broad. Margin beset with long, coarse, white appendages, 17 on each side, which are subequal in length, except the last 3 pairs near caudal end, which are much longer and more or less curved and about 2 to 2½ mm. long. The insect superficially has the appearance of an *Orthezia*. Color of body light pink or pinkish brown, which is easily seen on the ventral side. Legs and antennae light brown. When placed in potassium solution insect turns ferruginous brown, with a dark central spot in body and light margin. Antennae long and slender, of eight joints, of which the eighth is the longest. Joint 1 next, but very little shorter. Joints 6 and 7 subequal. All joints with long, stout hairs. Formula: 8, 1, 2, 3, 5, 4 (6, 7). Legs longer than antennae. Coxa broader than long. Trochanter plus femur very little longer than tibia plus tarsus plus claw. Tibia about twice as long as tarsus. Claw stout, with short flattened digitules, those of tarsus very long slender hairs. Anal orifice with six stout hairs, very little shorter than caudal setae. Caudal lobes very pronounced, quite broad, with many short, stout conical spines, varying in size, the longer ones in the center of the round-pore-area. Marginal processes or tubercles, not as prominent as those figured in the description of *T. madagascariensis* Newst., but quite pronounced.

Adult male of the usual type of Pseudococcini, with well developed caudal lobes, each bearing three long setae. Style short and stout. Antennae ten-jointed, of which joints 1 and 2 are subequal and the longest, and both are broader than the rest. Joint 3 is about twice as long as 4; the rest are subequal. Color of body reddish brown. Caudal setae snow-white; eyes black; legs and antennae of a lighter color than the body.

Habitat.—On the leaves of *Pandanus odoratissimus*, Honolulu, Hawaii. Differs from *T. madagascariensis* Newst. in not having as pronounced marginal tubercles, according to figure in text of description. Also in having more blunt spines on the tubercles. The antennae also vary in sequence of joints. I take pleasure in naming this species for my friend, W. M. Giffard, of Honolulu.

*Trionymus insularis* sp. n.

Adult female oviparous, about 2 mm. long by 1 mm. broad, of a dark pink color. Body slightly covered with white secretion, not sufficient to hide color or segmentation. Ovisac longer and broader than adult, loosely woven. Legs and antennae light brown. When placed in liquid potash body turns claret color. Antennae short and stout, eight-jointed, with joint 8 longest. Joint 1 twice as broad as long. Joints 1 and 2 subequal; joints 3 and 4 subequal; joints 5 and 6 subequal, and joint 7 very little longer than 6. Formula: 8 (1, 2), 7 (5, 6), 3, 4. All joints have a few hairs, which are quite long when compared with the length of the joints. On joint 7 there is one and on joint 8 four rather thick, stout, curved spines. Legs short and stout. Coxa and femur much stouter than tibia and tarsus. Femur one-third longer than tibia and tibia one-third longer than tarsus. Claw long and straight. Digitules of tarsus fine knobbed hairs, those of claw dilated hairs. The legs are quite hairy. Caudal lobes low, indicated by the long, slender setae. There are two long, fine spines and numerous hairs on each lobe. Anal ring large, with the usual six hairs, which are as thick and subequal in length with the setae. Derm thickly covered with short hairs and round pores; these are more numerous on the cephalic and caudal end of the body.

Young larva.—Antennae six-jointed. Joint 6 longest, about as long as 2, 3, 4 and 5 together. Legs long and stout, especially the femur. Caudal lobes not prominent, with long, fine setae and two sharp spines. Derm shows series of round pores on each segment and scattered over cephalic portion, also many fine hairs.

Habitat.—On *Deschampsia australis*, found in a Kipuka on the slopes of Mauna Loa, 6000 feet, Island of Hawaii (O. H. Swezey), and on *Cynodon dactylon* in various localities on the Island of Oahu, T. H.

Finding this insect in areas that have escaped lava flows (Kipukas) on the slopes of Mauna Loa would indicate that it has been on the Island for a long time. This species has been successfully transferred to *Paspalum conjugatum* in the laboratory for study.



*Ripersia palmarum* sp. n.

Adult female viviparous, pale reddish brown, about 3 mm. long, inclusive of caudal setae. Dorsum covered with dense white secretion, hiding segmentation. Marginal tufts very short but stout, getting longer caudad. Eight tufts at caudal end about 1 mm. long. These are sometimes curved upwards; sometimes they coalesce, forming plates which are very farinaceous. When placed in liquid potash body turns dark reddish brown, derm becomes transparent. Antennae six-jointed, stout and quite hairy. Joint 1 is broader than the rest and cone-shaped. Joint 6 is the longest; joints 1, 2 and 3 are subequal, as well as joints 4 and 5. Formula: 6, (1, 2, 3), 5, 4, or 6, (1, 2), 3 (4, 5). Legs are short and stout, a trifle longer than the antennae. Coxa broader than long. Femur about as long as tibia plus tarsus plus claw. Claw very stout. Tibia  $1\frac{1}{2}$  times longer than tarsus. Dorsum with rows of long fine hairs on each segment of body. Caudal lobes well defined, with two pairs of long setae, the outer pair about half as long as the inner pair, and five or six conical spines of various sizes and numerous stout hairs surrounded with many round and triocular pores. Marginal patches on the last four segments bearing groups of round pores with conical spines. Anal ring with six stout hairs about as long as caudal setae.

Larvae reddish brown, quite large when just hatched, active. Antennae and legs stout. Antennae six-jointed, the sixth the longest and as long as joints 2, 3, 4 and 5 together, which are subequal in length. Legs short and stout. Femur very stout. Tibia subequal with tarsus. Claw long and straight, abruptly curved. Caudal lobes well defined, with setae about twice as long as the hairs on anal ring. Rostral loop reaches beyond last pair of legs. Eyes red.

Male cocoon small, not densely felted.

Adult male.—Two forms have been found.

Apterous male very small, active, reddish brown, eyes red. Antennae eight-jointed, of which joint 8 is longest, about one-third longer than 2. Joints 1 and 2 are much broader than the rest, joint 2 being as broad as long. Joints 4, 5, 6, 7 are subequal. Legs long and slender, very little longer than antennae. Caudal lobes not very prominent, with short setae. Style quite pronounced.



Winged male similar to apterous form. Antennae nine-jointed. Joint 9 subequal with 2. Joint 2 is one-third longer than broad. Joint 3 with petiole. Joints 1 and 2 twice as broad as 3, 4 and 5. Joints 6, 7 and 8 are broader than 3, 4 and 5, but not quite as broad as 1 and 2. Joint 4 is shortest. All joints with numerous hairs and 8 with two stout bristles. Legs longer than antennae, quite stout. Femur plus trochanter equal to tibia. Tarsus about half as long as tibia. A few long hairs on femur and tibia on their margins. Tibia with two very stout spurs at its end. Tarsus with stout hairs on its inner margin. Digitules fine hairs. Claws very slender, long and straight, with sharp point, no digitules; at least none observed.

Habitat.—On various palms, *Cocos nucifera*, *Latania glaucophylla*, *Thrynax* and *Areca lutescens*, at Honolulu, Hawaiian Islands. This species has more the appearance of a *Pseudococcus*, on account of the thick secretion on the body and the marginal tufts.

*Nesococcus pipturi* sp. n.

Adult female viviparous, about  $1\frac{1}{2}$  mm. long by 1 mm. broad, moderately convex, light lemon yellow, thickly covered with fine, glossy hairs on dorsum, not hiding color of insect. Segmentation indistinct. Legs and antennae same color as body, or a trifle darker. Ventral part of body naked. When placed in KOH body turns orange brown and derm becomes transparent after boiling. Dorsum thickly covered with slender bristles, and round pores on each segment near margin, forming clusters of four or six pores as marginal patches. Antennae of seven joints, although specimens also show six-jointed antennae when third joint has not divided. Joint 7 longest, then joint 2. Joint 1 is twice as broad as long at its base. Formula of seven-jointed specimen is: 7, 2 (3, 4, 6), 1, 5, or 7, 2 (3, 4), 6, 1, 5. Each joint bears long, fine hairs, especially the last joint, which has numerous long, fine hairs. Antennae as well as the legs are short and stout. Femur is quite swollen. Tibia is two times longer than tarsus. Trochanter plus femur is subequal with tibia plus tarsus. Claw is long and sharply curved, with short, stout, curved, club-shaped digitules. The digitules of the tarsus are long, fine, knobbed hairs. The trochanter has a very long, fine hair

on its outer margin, about as long as the inner margin of the femur. Rostral loop reaches midway between second and third pair of legs. Caudal lobes not very prominent, with short, fine setae, when compared with the hairs of the anal ring, which are one-third longer and are stout and very pronounced. On the lobes are two stout spines and some fine hairs or bristles. The marginal groups of round pores on the last segment consist of eleven round pores each. In front of the anal ring on the ventral surface is a cluster of stout hairs. Between the antennae are several stout hairs.

Habitat.—On *Pipturus albidus*, Mount Tantalus, Oahu, Hawaiian Islands. January 16, 1916 (O. H. Swezey.)

NOTE:—Since the Annual Meeting when this paper was presented, several new species have been discovered. They are embodied in the original paper.—Ed.

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#### Election of Officers for 1916 resulted as follows:

President ..... J. F. Illingworth  
 Vice-President ..... W. R. R. Potter  
 Secretary-Treasurer ..... H. T. Osborn

Mr. Osborn being absent from Honolulu for the time being, Mr. O. H. Swezey was elected to serve as Secretary-Treasurer until Mr. Osborn's return.

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#### Some New Hawaiian Coleoptera.\*

BY DR. R. C. L. PERKINS.

The few species of Coleoptera described below are all of considerable interest and, with one exception, I am indebted for them to various friends in the Islands. It is for this reason that I am anxious that the descriptions be published. These descriptions were drawn up a considerable time ago and formed part of a much more extensive paper on Hawai-

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\*This paper was received from Dr. Perkins while this number of the Proceedings was being printed, and it seemed desirable to publish it at the present time.—Ed.